

REMARKS

Reconsideration of the application in view of the above amendments and the following remarks is respectfully requested.

Claims 1-14 and 22-35 are pending in this application. No claims have been amended.

The office action states that Claims 1,4,5,13,14,22,23,26-39, 32,and 35 are rejected under Section 35 U.S.C. 103(a) as being unpatentable over Merrill (US 6452633) in view of Thomas (US 6525769).

As cited by Examiner, Merrill states at Col 2, line 66 to col. 3, line 26:

"Another aspect of the present invention provides for producing a dark frame for the purpose of canceling out fixed pattern noise. Dark frame subtraction is employed to significantly reduce fixed pattern noise due to variations between pixels. Dark frame capture can easily be implemented electronically with a frame store imager simply by having a very short exposure time, preferably as controlled by the same timing and logic circuits that control automatic exposure. This eliminates the need for a mechanical shutter to perform the dark frame generation, which will save cost and complexity of the camera. A method is provided for obtaining calibration information for the individual pixels. Normally each pixel in an imager is reset to a reference level before an integration cycle begins. After the pixel is reset, photocurrent in the photodiode causes the voltage on its cathode and a storage capacitor to droop, corresponding to the signal. To generate a reference dark frame, the reset switch and the transfer switch connecting the photodiode to the capacitor are clocked in rapid succession so that there is no time for photocurrent to accumulate, generating a reference frame that can be subtracted from the image frame at a later time when both frames have been stored on the host system. The dark frame captures information about readout offset voltages of the individual pixels and an absolute zero-intensity reference per pixel. The dark frame may be captured before or after an

34 actual exposure frame. Gray frames for calibration may similarly be captured by varying
35 the Vref potential during reset. "

36 Examiner states " Examiner understands that the dark current signals are directly proportional
37 to exposure time, so by making an extremely short integration time.... the dark current would be
38 negligible when compared to the offset signal"

39 Applicant replies that Examiner understands correctly, but there is no evidence that Merrill did.
40 Merrill specifically states that he sets the recordation time such that "there is no time for
41 photocurrent to accumulate" and does not mention dark current in the above identified passage.
42 Examiner may not use hindsight, or the knowledge gained in the present application, to read into
43 the prior art that which is not explicitly pointed out.

44 In fact, the only reference to dark current in Merrill is to prior art:
45 "Because of the fast shutter capability, it is possible to perform these calibration image
46 measurements even without darkening the image on the sensor array. These calibration
47 images are not the same as prior art techniques that integrate a dark current over a time
48 interval--those techniques can also be used, to further remove leakage or dark current
49 artifacts, but they require actually darkening the image on the sensor array."

50 Wherein Merrill explicitly states that his application is *different* from prior art attempts to deal
51 with dark current. In fact, the whole point in Merrill is that he *never* shuts his light off, his light
52 current is (probably) *always* greater than his dark current. Merrill does not mention or suggest
53 measuring for a time t_s :

54 "where t_s is a short enough time that dark current signals and projected light produced signals
55 are small compared to offset signals in pixels of the first CMOS array".

56 but only where t_s is a short enough time that projected light produced signals are small.

57

58 Neither does Thomas mention or suggest measuring for a time t_s :

59 "where t_s is a short enough time that dark current signals and projected light produced signals
60 are small compared to offset signals in pixels of the first CMOS array".

61 Neither Merrill nor Thomas mention or suggest:

62 "a dark current monitoring device integrated with the first CMOS imaging array, the dark current
63 monitoring device monitoring the dark current during the time that the first CMOS
64 imaging array is receiving an image"

65 Thomas suggests measuring the dark current during the time the image is being transferred, not
66 during the time the array is receiving the image.

67 Since both prior art references lack *explicit* reference or suggestion to the above identified
68 elements of the independent claims, these claims, and all dependent claims, are allowable under
69 Section 35 U.S.C. 103(a) over Merrill (US 6452633) in view of Thomas (US 6525769).

70 Both cited references do not mention or suggest measuring the dark current for each pixel in the
71 array by taking a dark image, with long enough time to accumulate a dark current signal.

72 Rather, a generalized averaged dark current is suggested only by Thomas.

73 Even if the arguments advanced by Examiner were correct, "Examiner can satisfy the
74 burden of obviousness in light of combination only by showing some objective teaching [leading
75 to the combination]" (In re Anita Dembiczak and Benson Zinbarg No 98-1498). Applicant
76 states that no such teaching exists in the art cited. Unless Examiner can find some reference
77 with such an objective teaching, the independent claims are allowable on 35 U.S.C. 103
78 grounds.

79 In addition, applicant states that the dependent claims are patentable over their respective parent
80 claims, and all rejections of these claims have been overcome by the above arguments.

81 Applicant notes the allowability of claims cited by examiner, but, in Applicant's judgement, the
82 arguments offered above are persuasive, and the rewriting of the claims as independent claims is
83 not necessary at this time.

84 No fees are due. The required fees and any insufficiency or overage (except issue fees) may be
85 debited or credited to deposit account 08/2240. A signed deposit account authorization is on file
86 for this case.

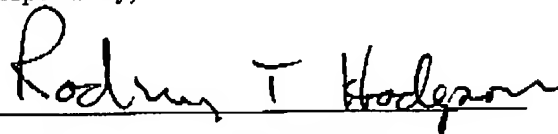
87 On the basis of the above amendments and remarks, reconsideration of this application
88 and its early allowance is respectfully requested.

89 CERTIFICATE OF FACSIMILE TRANSMISSION UNDER 37 CFR 1.8(a) and (b), 37CFR 1.86(f)-
90 I hereby certify that the following attached correspondence comprising Response is being sent by facsimile transmission to FAX NUMBER
91 571-273-1800 on December 9, 2005.

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Respectfully,

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